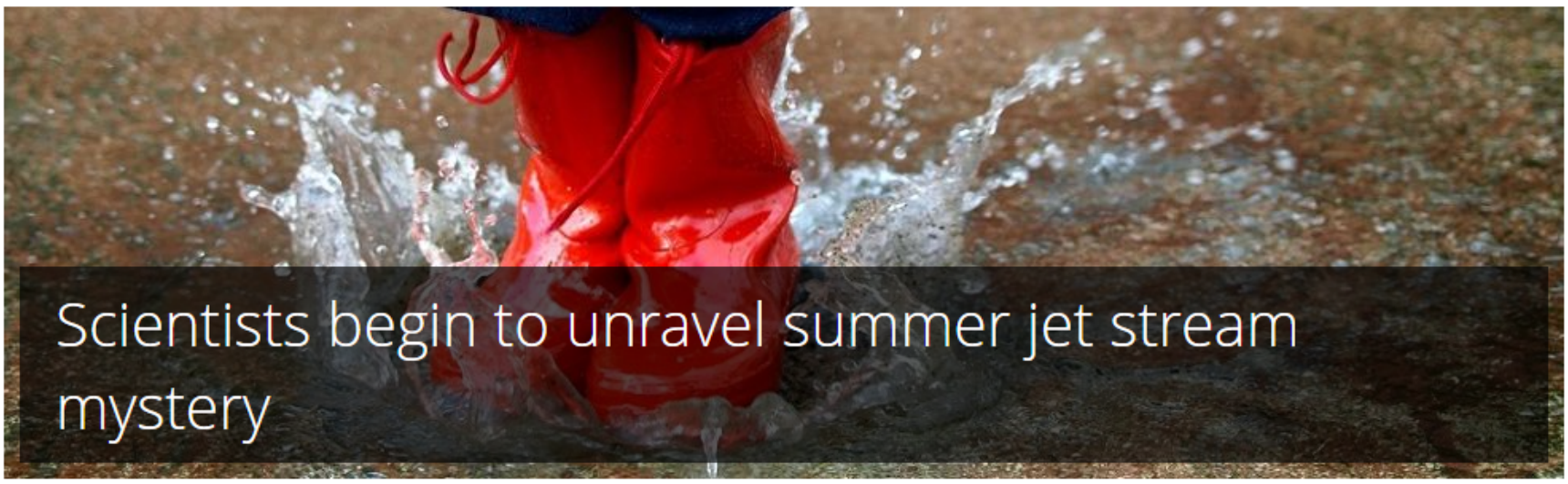

Scientists begin to unravel summer jet stream mystery

24 August 2016 - Scientists have discovered the cause of the recent run of miserable wet summers as they begin to unravel the mysteries of the Atlantic jet stream.

Researchers from the University of Sheffield and the Met Office have identified a number of possible factors that may influence the Atlantic jet stream and therefore help to predict summer climate from one year to the next.

The summer weather in the UK and north-west Europe is influenced by the position and strength of the Atlantic jet stream - a ribbon of very strong winds which are caused by the temperature difference between tropical and polar air masses.

A northward shift in the Atlantic jet stream tends to direct low-pressure systems northwards and away from the UK, leading to warm and dry weather during summer.

But, if the summer jet slips southwards it can lead to the jet shifting the low-pressure systems directly over the UK, causing miserable weather like we experienced in the first half of this summer. The big question is: "why does the jet stream shift?"

The report, led by PhD student Richard Hall and Professor Edward Hanna from the University of Sheffield's Department of Geography, discovered that up to 35 per cent of this variability may be predictable - a significant advance which may help in the development of seasonal forecasting models.

Lead author of the study, Richard Hall, said: "There is nothing people in the UK like to discuss more than the weather. This is because it can fluctuate so drastically - we can be basking in high temperatures and sunshine one week only to be struck by heavy downpours and strong winds the next.

"Our study will help forecasters to predict further into the future giving a clearer picture of the weather to come."

The findings suggest the latitude of the Atlantic jet stream in summer is influenced by several factors including sea-surface temperatures, solar variability, and the extent of Arctic sea-ice, indicating a potential long-term memory and predictability in the climate system.

Edward Hanna, Professor of Climate Change at the University of Sheffield, said: "Working with the Met Office we were able to look at the different factors which may influence the jet stream, which paves the way for improvements in long-term forecasting."

Professor Adam Scaife, Head of long range forecasting at the Met Office, said: "We've made big inroads into long-range forecasts for winter, but we are still limited to shorter-range weather forecasts in summer. Studies like this help to identify ways to break into the long-range summer forecast problem."

The study, published in the journal Climate Dynamics was funded by the University of Sheffield's Project Sunshine now the Grantham Centre for Sustainable Futures, and was conducted in collaboration with the University's School of Mathematics and Statistics (SOMAS).

Further research will seek to establish the physical mechanisms behind these links and identify the different influences that jet speed and latitude bring to bear on our summer weather.

The other co-authors on the work were Dr Julie Jones, from the University's Department of Geography, and Professor Robertus von Fay-Siebenburgen, from SOMOS.

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